

CANADIAN COUNCIL OF FOREST MINISTERS'
CRITERIA AND INDICATORS OF SUSTAINABLE FOREST MANAGEMENT
INDICATOR REVIEW

SECOND TECHNICAL WORKING GROUP MEETING
25 & 26 April, 2002, Ottawa, Ontario



SUMMARY LIST

**TECHNICAL WORKING GROUP PRELIMINARY LIST
OF IMPROVED CCFM INDICATORS
FOR SUSTAINABLE FOREST MANAGEMENT**

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CCFM C&I REVIEW DRAFT PRELIMINARY INDICATORS

Results of April 25 & 26 Technical Working Group Meeting

INTRODUCTION:

This document contains a summary of the revised indicators which resulted from the work of the Technical Working Groups (TWG) during their second meeting On April 25 & 26, 2002 in Ottawa, Ontario. This list was compiled from the submissions made to the Secretariat by the TWG chairs.

More detailed information on the rationales, measurement units, benchmarks, relationships to other C&I process, etc. is available in the accompanying working document.

SPECIAL NOTE FOR CRITERION 5

At the end of the April meeting, there were 55 indicators in Criterion 5, some of which had overlapping or closely related themes. The TWG chair has merged similar indicators within criterion 5. In such cases, the original wording of the similar indicators has been retained, but is separated by “//”. The resultant list has 36 indicators.

Criterion	Number	Indicator
C. 1: Conservation of Biological Diversity	1.1.1	Area of Forest Types
	1.1.2	Area of age class by forest type
	1.1.3	Area of forest types in protected areas (Categorized by each IUCN class)
	1.1.4	Patch size distribution (disturbance and residual)
	1.2.1	The status of forest-associated species at risk
	1.2.2	Population levels within an acceptable range of species at risk, economic significant species and indicator species
	1.2.3	Distribution of species at risk, economic significant species and indicator species.
	1.2.4	Number of exotic species by forest type
	1.1.5	Road/linear corridors density/use/type and location?
	1.1.6	Forest structure – Tree age diversity, size and life status (healthy, declining, dead)
C. 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity Element 2.1: Incidence of disturbance and stress (biotic and abiotic) Element 2.2: Ecosystem Resilience Element 2.3: Ecosystem response.	2.1.1	Total area of the forest disturbed annually by natural and anthropogenic activities by forest type and ecoregion. (<i>New Indicator – Core Indicator</i>)
	2.1.1.1	Area, severity and patterns over time of insect infestation by ecoregion as compared to historical variation. (<i>Revision of Indicator 2.1.1 – supporting indicator.</i>)
	2.1.1.2	Area, severity and patterns of the impact of fire by ecoregion as compared to historical variation. (<i>Revision of Indicator 2.1.3 – supporting indicator.</i>)
	2.1.1.3	Area and percentage of ecozone harvested by harvest method/system. (<i>New indicator – supporting indicator.</i>)
		Area, severity and patterns of impacts of disease by ecoregion as compared to historical variation. (<i>Revision of Indicator 2.1.2 – supporting indicator.</i>)
	2.1.2	Annual removal of wood products compared to the volume determined to be sustainable. (<i>Indicator 5.1.1</i>)
	2.1.3	Percentage of disturbance type salvage logged by ecoregion. (<i>New indicator</i>)
	2.1.4	Percentage of a region within 0.5 kilometre of a motorized vehicle corridor. (<i>New indicator</i>)
	2.1.5	Rates of pollution deposition by ecoregion. (<i>Revision of Indicator 2.1.4</i>)
	2.1.6	Ozone concentrations by ecoregion (<i>Revision of indicator 2.1.5</i>)
	2.1.7	Climate change as defined by significant climate variables. (<i>Revision of Indicator 2.1.8</i>)
	2.2.1	Percentage and extent of forest type and age class by ecoregion. (<i>Indicator 2.2.1</i>)
	2.2.2	Percentage of disturbed areas regenerated to original forest type by ecoregion by disturbance type. (<i>Revision of Indicator 2.2.2</i>)
	2.2.3	Area and percentage occupied by non-indigenous species by ecoregion. (<i>Revision of Indicator 2.1.7</i>)
	2.3.1	Growth rates and growing stock by forest type and age class by ecoregion. (<i>Revision of Indicator 2.3.1</i>)

	2.3.2	Frequency of occurrence within selected species (vegetation, birds, mammals, fish). (<i>Indicator 2.3.2</i>)
		Regeneration to other species e.g., animal species (Potential Indicator)
		Density of linear features defined by linear feature type by ecoregion. (Potential Indicator)
		Proportion of forested areas not disturbed by ecoregion. (Potential Indicator)
		Annual removal of non-timber products. (Potential Indicator)
		Nutrient export from forested watersheds. (Potential Indicator)
		Area and percentage of ecoregions with impaired ecological processes. (Potential Indicator)
Criterion 3: Conservation of Soil and Water Resources		Area of forest converted to non-forest land use e.g., urbanization
		Percentage of managed forest area used for main roads, haul roads, landings, staging areas, secondary roads, and trails having received more than four passes of machinery without impact mitigation measures (low impact tires, treads; placed slash beds etc.)
		Percent of forest landbase occupied by Permanent Access ((i.e. main roads, haul roads, landings and permanent trails)
		Percent of reforested landbase that has soil disturbance, that if excessive, could impair the productive capacity of the soil, or the ecosystem or hydrologic function of the soil
		Area, percentage and representativeness of soil types, as bench marks, in protected areas.
		Processes in place to monitor soil quality as effected by SFM practices on representative soil types (by ecoregion?)
		Processes in place to ameliorate contaminants and monitoring systems (where a concern) are in place
		Area of forest harvested using full-tree harvesting technology
		Area of forest converted to non-forest land-use (that may affect water quality); eg., pipelines, transmission lines, seismic lines, dams, etc.
		Area of forest converted to non-forest land-use (that may affect water quality); eg., pipelines, transmission lines, seismic lines, dams, etc.
		Percent of forested landscape having road construction, stream crossing, and riparian zone regulations in place
		Percentage of area with managed and unmanaged watersheds where a process is in place to monitor the impacts of forest management on water quality, quantity and timing.
		Percent of area where a process for the identification and mediation of water contamination is in place, and for areas of concern, a monitoring system is in place
		Percent of forest landbase where watershed assessments are done as part of planning and approval of development (eg., BC watershed assessment program, where the impacts of harvesting extent and distribution of snowmelt/accumulation, runoff, etc, are evaluated
		Frequency of erosion events on managed soils
		Distribution and abundance of aquatic habitat and invertebrates (potential Indicator)

		Number of forest catchments where the distribution and extent of harvesting (and roads and stream crossings) will lead to water quality measurements (to be determined) for values outside those expected for undisturbed watersheds (potential Indicator)
<p>Criterion 5: Multiple Benefits to Society</p> <p>(suggested new name: Maintenance and Enhancement of Multiple Socio-Economic Benefits to Society)</p> <p>Economic Element</p>	5.1	Value added products (and services?)
	5.2	(CCFM 5.3.1) Value of wood products production // Contribution to GDP
	5.3	(CCFM 5.3.1) Value of non-wood forest products production // Contribution to GDP // Value of furs on market annually
	5.4	(CCFM 5.3.1, 5.4.2) Value of forest-based services // Contribution to GDP // (Participation and) expenditures in outdoor recreation activities by province
	5.5	Supply and consumption of wood and wood products, including consumption per capita
	5.6	(CCFM 4.4.1) Degree of recycling of wood forest products
	5.7	Supply and consumption/use of non-wood products
	5.8	No. of game licences
	5.9	No. of game taken (hunting success)
	5.10	(CCFM 5.3.3, 5.3.4) Products and services that were not marketed, but are equivalent to goods and services available in a market
	5.11	Number of visitor days attributed to recreation and tourism, in relation to population and forest area // Participation (and expenditures) in outdoor recreation activities by province
<p>Criterion 5 Social Element</p>	5.12	Crown forest area available for the production of timber products // (CCFM 5.1.2 reworded to MP 2.a) Area of forest land and net area of forest land available for timber production
	5.13	Crown forest area available for non-timber products
	5.14	Habitat available for important species of wildlife
	5.15	(CCFM 6.2.4) Area and percent of forest land available for subsistence purposes
	5.16	(CCFM 5.4.1) Area and percent of forest land managed for general recreation and tourism, in relation to the total area of forest land
	5.17	Availability of recreational opportunities by type of activity and by province
	5.18	Area and percent of forest land managed in relation to the total area of forest land to protect the range of cultural, social and spiritual needs and values
	5.19	Proportion of private lands that are under management plan
<p>Criterion 5 Socio-economic Element</p>	5.20	Percent authorized (available) harvest area actually harvested // Annual removal of industrial roundwood relative to the sustainable level of harvesting // (CCFM 5.1.1) Annual removal of wood products compared to the volume determined to be sustainable
	5.21	Distribution of # of FMUs that are over and under harvesting, relative to the sustainable level
	5.22	Annual removal of non-timber products relative to the sustainable level of harvesting // Non-wood harvest, relative to sustainable level
	5.23	Capacity vs. utilization ratio of recreational areas by regions.
	5.24	Rate of return by sector (proxy - operating surplus); forestry, tourism, mining... return on capital employed, equity, // (CCFM 5.2.1) Rates of return on investment // Net profitability
	5.25	Value added per hour - labour productivity // Trends in productivity

	5.26	Employment levels // Total employment in all forest related sectors // Total employment related to forest recreation and tourism // (CCFM 5.3.2) Employment (direct, indirect, and induced) supported by all forest-related sectors
	5.27	Proportion of full-time employment
	5.28	Average income in major employment categories in all forest-related sectors
	5.29	Average injury rates in major employment categories in all forest-related sectors
	5.30	(CCFM 6.3.1) Number of communities with significant economic dependence on forest-related sectors
	5.31	Viability and adaptability to changing economic conditions, of forest dependent communities, including Aboriginal communities
Criterion 5 Institutional Element	5.32	Forest management expenditures // (CCFM 5.1.4) Investment in the health, productivity and accessibility of forest resources to support socio-economic benefits
	5.33	Non-timber products - management expenditures
	5.34	Trends in R&D expenditures in forestry // (CCFM 5.2.3) Investment in research and development, and education
	5.35	Expenditures in forest-based industries' machinery
	5.36	Number and type of facilities available for general recreation and tourism, in relation to population and forest area
Criterion 6: Accepting society's responsibility for sustainable development	6.1.1	Provision of Aboriginal and Treaty Rights within forest policy and management
	6.1.2	Number of legal challenges launched associated with Aboriginal and Treaty Rights
	6.2.1	Personal security index of Aboriginal communities
	6.2.2	Proportion of Aboriginal population employed in the forest sector
	6.2.3	Education attainment levels
	6.2.4	Extent to which forest management planning offers protection for significant Aboriginal forest values as identified by Aboriginal communities
	6.2.5	Proportion of reserve forestlands currently managed under integrated forest management plans
	6.2.6	Number of agreements with First Nations to fully or jointly manage forested lands
	6.2.7	Proportion of all forestlands that are fully or jointly managed by First Nations
	6.3.1	Index of the diversity of the local industrial base
	6.3.2	Diversity of forest use at the community level
	6.3.3	Proportion of total forest area and proportion of managed forest area under community stewardship or co-management responsibilities
	6.3.4	Education attainment levels
	6.3.5	Personal security index
	6.4.1	Degree of public participation in the design of decision-making processes
	6.4.2	Degree of public participation in the decision-making process
	6.4.3	Degree of public participation in the implementation of decisions and monitoring of progress toward sustainable forest management
6.4.4	Number of non-Aboriginal legal challenges associated with forestland use planning	

	6.5.1	Percentage of area covered by multi-attribute resource inventories
	6.5.2	Rate of continuing education among woodlot owners
	6.5.3	Rate of continuing education among forestry professionals